# Tomography at 5BMC: background, status, and future plans

**Denis T. Keane**

***DND-CAT***

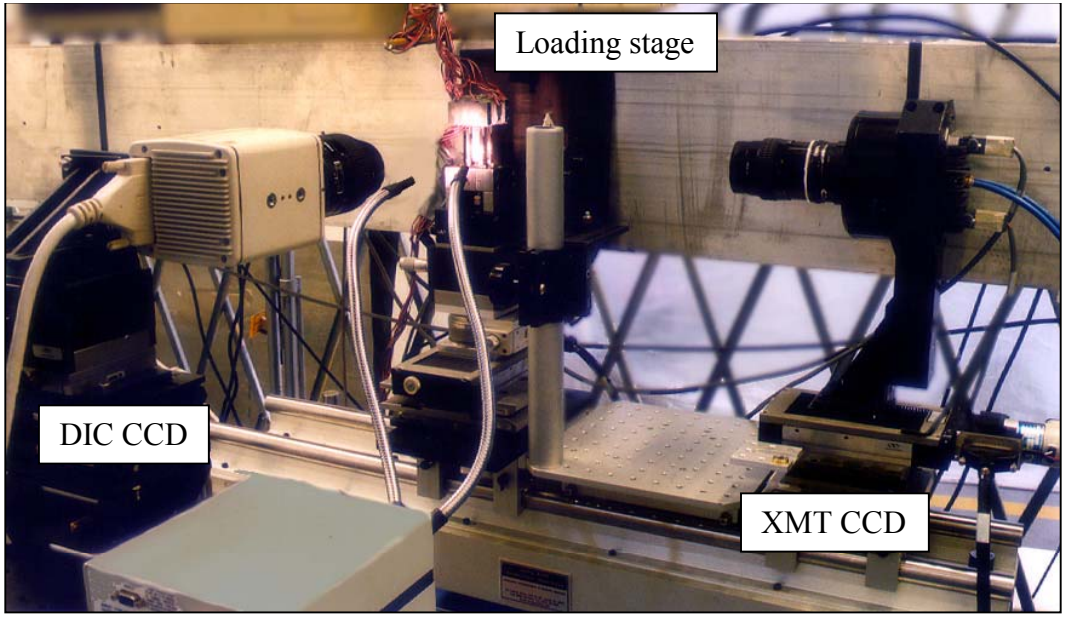
***Dept. of Materials Science and Engineering***

***Northwestern University***

# 5BMC Hutch

Denis T. Keane • dtkeane@northwestern.edu • DND-CAT/Materials Science and Eng. Dept. • Northwestern University

# Original setup

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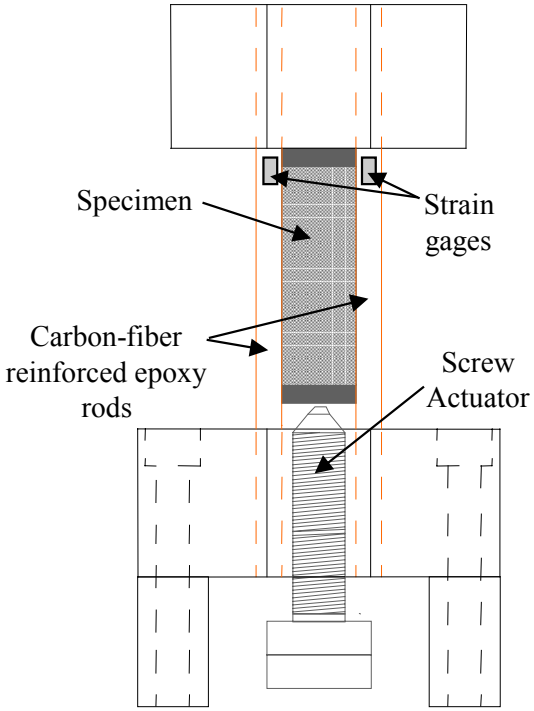
# Tomography of Concrete

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# Concrete Data

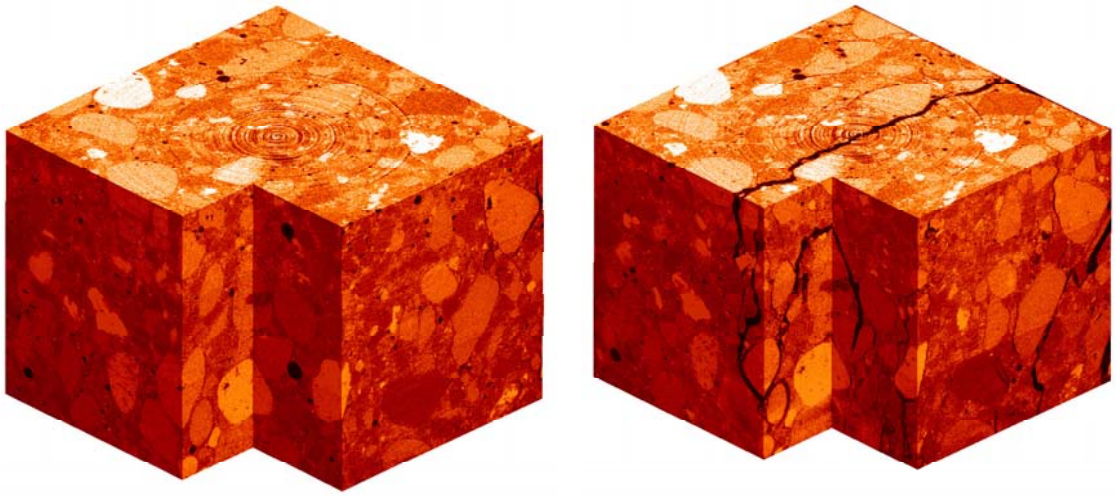

**Fig. 13. Reconstructed volume at 92% of peak load and 13% of peak load (post-peak) for sand aggregate**

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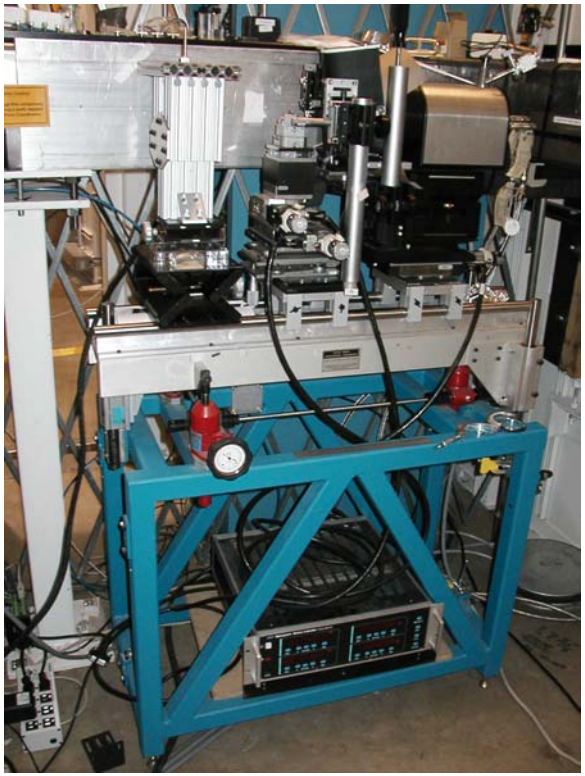
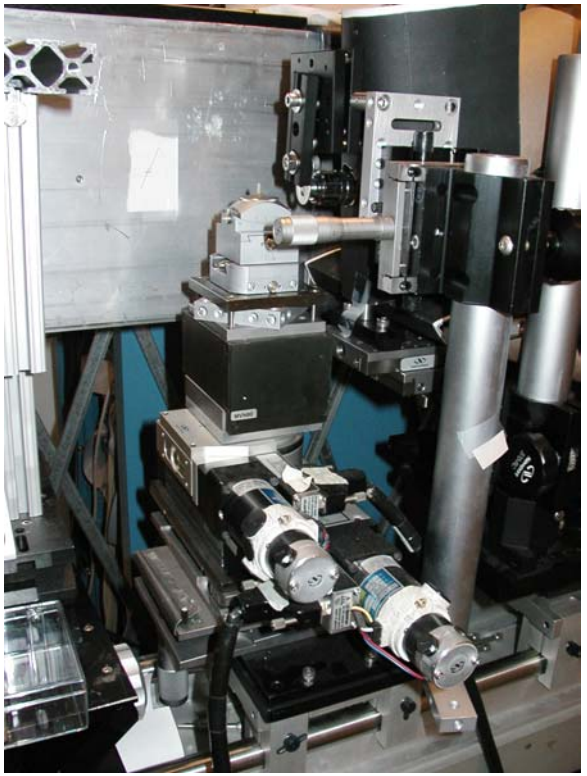
# Current Tomography Setup





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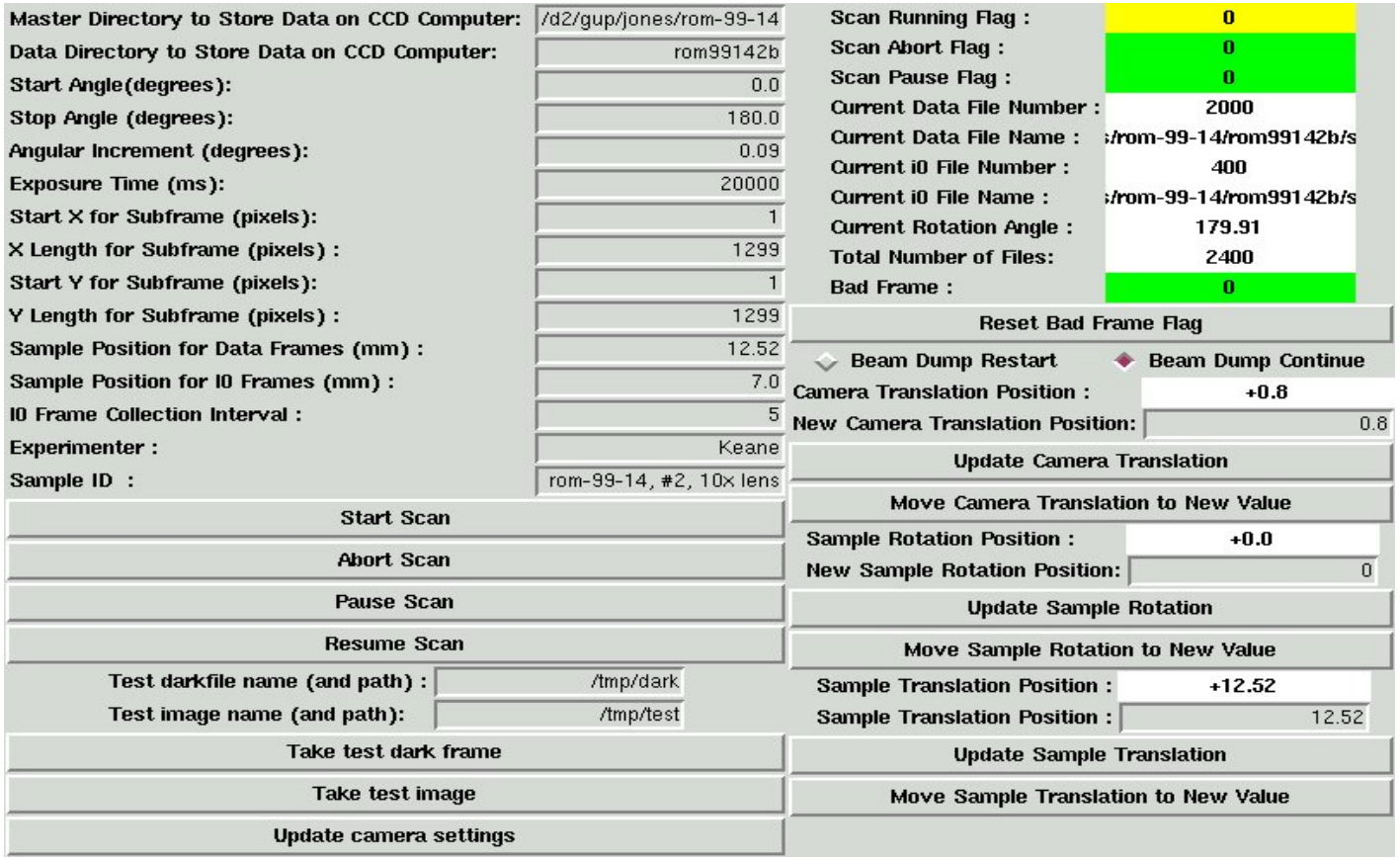
# Control Software

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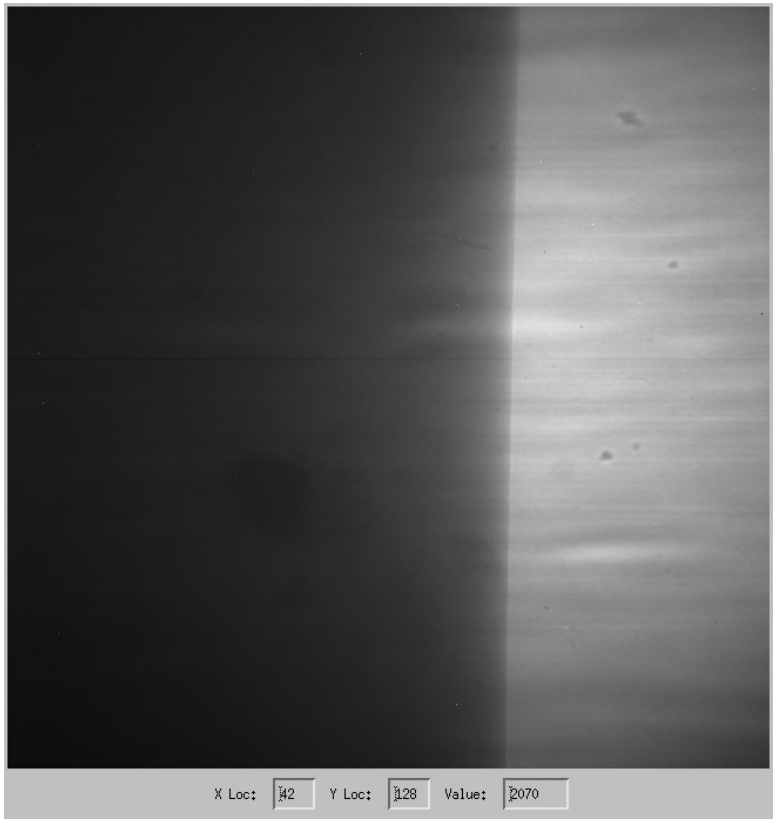
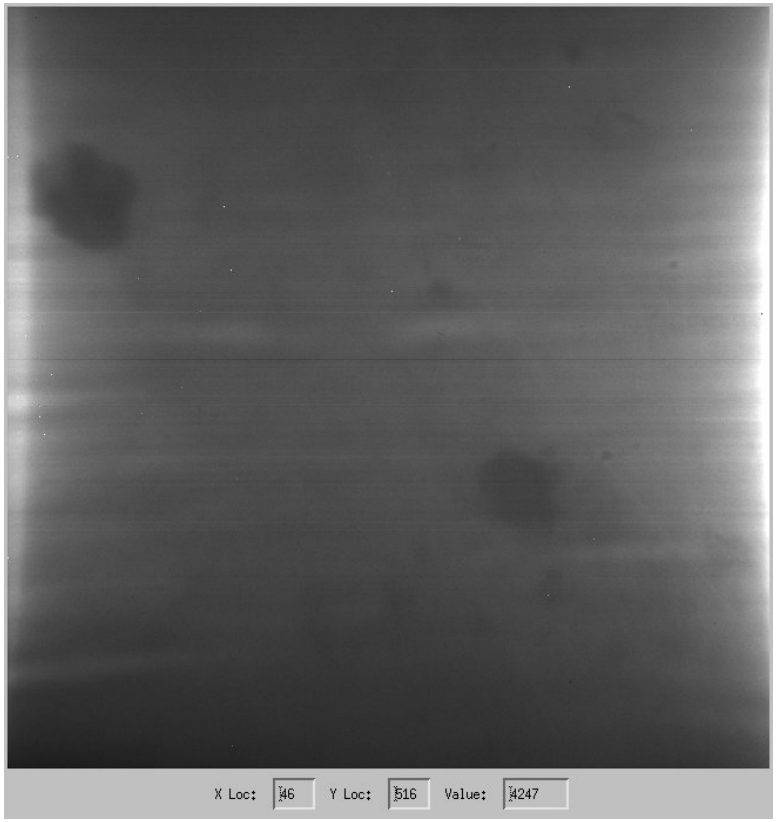
# Typical Images

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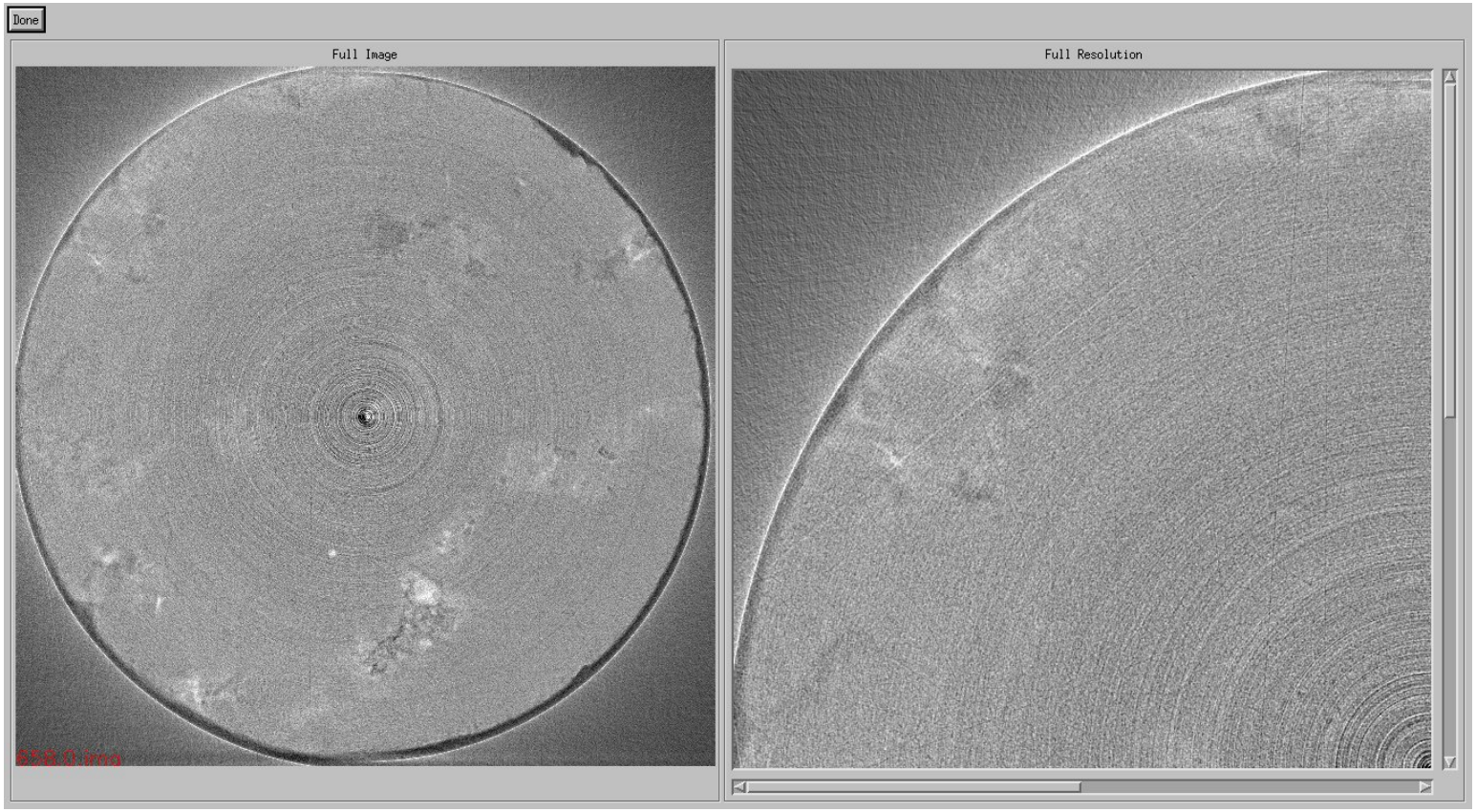
# Processing Data

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# Current Setup

## Beamline

- **Si(111) crystals: 7 keV to > 40 keV, shared with powder**

## Controls

- TK based graphical user interface
- IDL for image analysis/viewing
- Newport stages for sample motion, focussing

## Roper Camera

- **Crotiger cooling**
- **1300x1340, 24 micron pixels, 16 bit readout, 1 Mhz**

## Reconstruction

- CBREC from Mayo clinic
- Parallelized by John Quintana: 10+ node linux cluster

# Future Plans

## Beamline

- White beam into hutch, multilayer mono

## Instrument

- New optics: better projection onto large CCD
- New high precision Newport stages: translate, rotate, height adjust
- Robot for sample changing (similar to sector 2)
- X-ray maginfication post sample?

## Reconstruction

- Use of non-FBP algorithm?

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# Acknowledgements


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- Brian Stephenson: IBM (now ANL)
- Paul Thomas: Mayo (CBREC program)
- John Quintana: DND-CAT (control programs and parallelizing CBREC)
- John Lawler, Surendra Shah: Northwestern (concrete data)

# Outline

- **Background**
  - **Keane post-doc at IBM: work at X2B**
- **Initial XMT setup at 5BMC**
  - **Camera details**
  - **Some experiments**
- **Current setup**
  - **Beamline characteristics**
  - **New Roper camera**
  - **Experimental setup and control**
  - **Reconstruction procedures**
- **Future plans**
  - **New precision stages**
  - **New light optics**
- **Issues for discussion**
  - **Exxon patent issues**
  - **Basis for common user interface**